COAL AND TIN DISCOVERIES IN WESTERN AUSTRALIA.

MR. HARRY P. WOODWARD, Government Geologist for Western Australia, sends, under date May 28, 1889, some interesting particulars of both coal and tin discoveries in that colony. He writes:—

"From Vasse I made for the Lower Blackwood River Bridge, over the foot of the Darling Range, and so on to the Donelly River. On the south coast, where a small stream flows out, called the Fly Brook, coal has been found of a very good quality, but there is no port nearer than Albany or Vasse, and this latter is not a good one. There seems to be a line of coal-bearing country between the coast-range, which runs north and south from Cape Leeuwin to Cape Naturalist, and the main highlands, the southern continuation of the Darling Range; much of it covered with sand and swamps at the surface, but under which I believe we shall find coal-measures which may, in fact, extend west beneath Perth to the Irwin River, but this can only be tested by deep borings.

"There was nothing to be seen of the coal or rocks, as they are boring with a 'jumping-drill,' which reduces everything to mud, but there is one 5-foot seam and several smaller, averaging 17 feet of coal in 200 feet of rock. There are two or three outcrops in the bed of the Creek of a much weathered but good coal, some of which is highly bituminous. From Bridgetown I went to Albany, and thence east 200 miles to the Phillip River, and saw the Fitzgerald Coal-field. This is only brown coal or lignite of no value, but there is some good-looking gold-bearing country near it."

TIN-ORE.—In reference to the tin discoveries, Mr. H. P. Woodward writes:—

"From Bunbury I went towards the Upper Blackwood, to a place called Bridgetown, where tin has been found. Little work has been done yet, but, as far as I am able to judge, it seems to indicate the biggest thing of the kind that has ever been found. One shaft, 18 feet deep, will wash all the way down at about 4 or 5 pounds to the pan, and they have not got to the bottom of it yet. The richest works in other colonies are rarely more than 2 or 3 feet deep. Tin has been found at the surface, in the sand, over an area of about 100 square miles, but no sinking, except the one shaft, has yet been made; and as the surface is covered, either with sand or clay-ironstone, the formation cannot be seen at all. The late Mr. Edward T. Hardman suggested that tin would be found here. The shaft shows a few inches of soil or alluvium with gravel containing tin, where it was first found, resting on hard masses of clayey ferruginous sandstone, about 1 foot thick, then coarse quartz-grit with stream-tin and tourmalines and a few 'colours' of gold. 17 feet not gone through yet, as there was too much water, about $\frac{1}{6}$ in weight being tin-ore." H. W.

NOTES.

THE Committee appointed to consider the basis upon which the grant of £15,000 a year for University Colleges in Britain should be distributed have recommended that the grant should be divided as follows:—To Owens College, Manchester, £1800; to University College and King's College, London, £1700 each; to Liverpool University College, £1500; to Mason College, Birmingham, the Yorkshire College, Leeds, and Nottingham University College, £1400 each; to Bristol University College, the Durham College of Science, Newcastle-on-Tyne, and Firth College, Sheffield, £1200 each. The Committee are of opinion that University College, Dundee, should be dealt with in connection with the Scottish Universities, and especially with the University of St. Andrews; but they recommend that it should for the present year have a grant of £500.

A TESTIMONIAL is to be presented to Prof. Kennedy by his former students on the occasion of his resignation of the Chair of Mechanical Engineering at University College, London. A committee has been appointed to receive subscriptions, and no doubt many persons will be glad to have this opportunity of expressing gratitude for the profit they have derived from Prof. Kennedy's instructions. The Chair from which he is retiring he has held during the last fifteen years.

IN answer to a question put by Mr. Acland in the House of Commons on Monday, Mr. W. H. Smith said the Government were aware of the great interest taken by the country in technical education, and the pressing importance of dealing with it. They had been engaged during the previous few days in endeavouring to find some solution of the difficulty which surrounds the question in regard to elementary schools, but, he regretted to say, without success. The Government therefore proposed to introduce at once a measure dealing with the higher branch of the subject.

AT a general meeting of Welsh members, held at the House of Commons on Tuesday, for the purpose of conferring with Sir W. Hart-Dyke on the Intermediate Education (Wales) Bill, the Vice-President of the Council announced that, provided all the amendments on the paper were withdrawn, the Government were willing to accept an arrangement whereby the Education Council to be constituted under the Bill should consist of five members—three to be nominated by the County Councils, and two by the Education Department. Were the meeting to agree to this, then the Government would use their best efforts to pass the measure into law before the end of the session. The proposal thus made was debated at some length, and was finally adopted.

THE half-yearly general meeting of the Scottish Meteorological Society was held yesterday in Edinburgh. The Council of the Society presented its report, and the following papers were read:—"Proposed Investigation of the Numbers of Dust Particles in the Air at the Ben Nevis Observatory," by Prof. Tait; "The Distribution of Temperature over the Globe," by Dr. Buchan.

AT the last meeting, this session, of the Royal Society of Edinburgh, the Chairman, Prof. Chrystal, in closing the business, said that, during the period, 86 papers had been read, of which 21 had been in the department of natural philosophy, 16 in mathematics, 7 in chemistry, 2 in geology, 6 in zoology, 6 in botany, 23 in physiology, 2 in astronomy, and 3 in meteorology. A good number of these papers had come from the newly-instituted laboratory in the College of Physicians, and he congratulated that body on the public spirit manifested in the opening of the laboratory, and on the excellent results that followed. Eighteen new members had been added to the roll, the average in the three previous years having been 36; and 7 ordinary and 2 honorary members had been lost by death.

THE floral *fête* of the Royal Botanic Society, held on the 15th inst., to celebrate the jubilee, is a fitting occasion to recall the memory of the founder, Mr. Philip Barnes, who originated the idea, and planned and carried into execution the installation of the Society. The faculty of creation is not given to everyone. Due honour should therefore be given to those who, endowed with it, use it for the interest of science and the public good.

AT the Congress of Physiological Psychology, to be held in Paris (August 5-10) the following subjects will be discussed: muscular sense; *rôle* of movements in formation of images; is the attention always determined by affecting states?; statistical study of hallucinations; the appetites in idiots and imbeciles; are there in insane persons motor impulsions independent o images and ideas?; psychical poisons; heredity; heredity of emotional phenomena and their expression; heredity of peculiarities in the perception of colours; heredity of special memories and of special aptitudes (technical, artistic, scientific); psychological analysis of some genealogical tables; hypnotism; causes of errors in observation of phenomena of hypnotic suggestion; normal and hypnotic sleep; motor power of images in hypnotized subjects, and unconscious movements (automatic writing, &c.); doubling of personality in hypnotism and mental alienation; phenomena of transfer; precise terminology in questions of hypnotism. (Communications to M. Richet, 15 Rue de l'Université, Paris.)

THE Leaf-insect of the Seychelles lately living in the Zoological Society's Insect House, which we figured in our issue of May 30 (p. 105), has unfortunately died, before attaining complete development. But specimens of two other scarce Orthopterous insects have lately been added to the collection. Many examples of one of the curious Stick-insect (*Diaphemora femorata*) of North America have lately been hatched from eggs received from Mr. Williams, of Toronto. The young insects are feeding well on the leaves of the common hazel and grass, and some of them have already attained a considerable size, while others are still emerging from the ova. Besides these, two examples of a very singularly shaped form of Mantidæ from South Africa (*Harpax ocellata*) have just been received from Colonel J. H. Bowker, of Durban, and appear likely to do well. A third object of considerable interest, lately lodged in the Insect House, is a fine example of the Cocoa-nut Crab of the East Indies (*Birgus latro*), presented by Commander Alfred Carpenter, R.N. This is a terrestrial Crustacean of peculiar structure, which subsists entirely upon vegetable food, and is said to be able to open cocoa-nuts. Darwin has given an interesting account of its habits in his "Naturalist's Voyage," and Prof. Moseley met with it in one of the Philippine Islands during the voyage of the *Challenger*. The Zoological Society's example appears to prefer bananas to other food, but has also eaten some lettuce.

M. DESCHAMPS, a French zoologist, has, says the *Ceylon Observer*, arrived at Colombo from Singapore. He has been sent out by the French Government to study the zoological features of the Laccadive Islands, but as it is almost impossible to reach them during the south-west monsoon, he will spend two or three months in Ceylon, during which time he hopes to pursue his researches in various parts of the island. About October he will make his way to the Malabar Coast, and from thence to the Laccadive Islands.

THE Government Geologist of New South Wales has prepared a map showing the areas within which artesian water-supplies may be bored for with good prospects of success. Water-bearing formations extend for 60,000 square miles in the arid parts of the colony, where permanent supplies are most needed; and the system of artesian wells is being widely adopted throughout Australia with the most satisfactory results. Large tracts of good pastoral country, which have hitherto been totally valueless through the want of a regular water-supply all the year round, are now capable of supporting flocks and herds.

THE Audubon Monument Committee of the New York Academy of Sciences complain that as yet comparatively few members of the Academy have given anything towards the erection of the proposed monument to Audubon. The considerable sum already received has come mainly from others. The plans accepted by the Committee will require from $6000 to $10,000 for their execution. Up to the present time, about $900 has been received. The Committee have issued a portrait of Audubon, suitable for framing, a copy of which will be sent to everyone who contributes to the fund to the amount of a dollar or more.

ACCORDING to an official notification of the trustees of the "Schwestern Fröhlich Stiftung" at Vienna, certain donations and pensions will be granted from the funds of this charity this year in accordance with the will of the testatrix, Miss Anna Fröhlich, to persons distinguished in any branch of science, art, or literature who may be in want of pecuniary support through accident, illness, or infirmity consequent upon old age. The grant of such temporary or permanent assistance in the form of donations or pensions is, according to the terms of the foundation deed, primarily intended for Austrian artists, literary men, and men of science, but foreigners of every nationality may benefit by the fund provided they are resident in Austria. Austrian subjects residing in England, who may desire to make application for a grant, can obtain all necessary information at the Austro-Hungarian Embassy in London.

ACCORDING to a telegram from New York, dated July 20, there had been slight shocks of earthquake at Memphis and in the vicinity.

THE Pilot Chart of the North Atlantic Ocean for July shows that two well-defined depressions moved up along the American coast during June. One originated over the Bahamas, on the 1st, whence it moved about north-north-east, accompanied by moderate gales, and disappeared in New England on the 5th. The other was a typical West India hurricane in every respect except violence; it first appeared south-west of Jamaica on the 14th. Heavy rainfall accompanied the passage of the storm, and caused great damage in Cuba, and on the 20th the depression seems to have united in Canada with another from the Lake region, and the combined storm moved east-north-east over Labrador, and out to sea. Much fog was encountered during the month, and many icebergs were reported between the 40th and 50th meridians, and as far south as 42° 54′ N., showing a marked southerly drift. The fact that the fog-belt is apt to overlap the iceberg region at this season makes navigation dangerous over the Transatlantic lines. One of the wrecks has an interesting history. The Italian barque *Vincenzo Perrotta*, abandoned on September 18, 1887, began her remarkable drift in about lat. 36° N., long. 54° W., and when last reported, on April 4, 1889, was about sixty miles north of Watling's Island, in the Bahamas, having made a distance of about 1400 miles in a south-west by west direction in little more than a year and a half.

AT the meeting of the Linnean Society of New South Wales, on May 29, Mr. C. T. Musson exhibited the leg of a pigeon to which a ball of earth, weighing, when dry, 9 grains, was found adhering. It would be hard to find a more striking illustration of the way in which birds may be the means of dispersing seeds. Mr. Musson also recorded a case in which a land snail (*Vitrina* sp.) was found adhering to the elytron of a beetle, whereby its migration beyond its normal habitat was to a limited extent rendered possible.

IN an article on "Blindness and the Blind," in the current number of the Journal of the Franklin Institute, Dr. Webster Fox refers, among other things, to the need for care being exercised with regard to the eyes of young children. The eyes are more sensitive to light in childhood than in adult life, yet a mother or nurse will often expose the eyes of an infant to the glare of the sun for hours at a time. Dr. Webster Fox holds that serious evils may spring from this, and he even contends that "the greater number of the blind lose their sight from carelessness during infancy." From the point of view of an oculist, he protests against the notion that children should begin to study at a very early age. He thinks that until they are between seven and nine years old the eye is not strong enough for school work. When they do begin to learn lessons, they "should have good light during their study hours, and should not be allowed to study much by artificial light before the age of ten. Books printed in small type should never be allowed in school-rooms, much less be read by insufficient light."

IN the new volume of the Transactions and Proceedings of the New Zealand Institute there is an instructive paper by Mr. A. Reischek on the wandering albatross (*Diomedea exulans*). Towards the end of January 1888, he had an opportunity of watching this bird closely among the hills of one of the Auckland Islands. Starting in search of some specimens, he was lucky enough, after a good deal of climbing, to come to a slope where a colony of albatrosses had established a breeding-place. The birds were scattered about among the tussock-grass, sitting on their nests, and from their white plumage could be easily distinguished from the vegetation at a great distance. Mr. Reischek found that their nests are always placed on sloping ground, and always on the most exposed side of the hill. The nests are composed of earth and grass cemented together, and are built in the form of a cone. They are usually about 2 feet in diameter and about 18 inches high. Outside they are surrounded by a shallow drain, intended to carry off the surface-water. Within is placed a single egg. This is white, with a few brown spots on the broad end, and measures about 5·5 inches in length by 3·1 inches broad. In most cases he found the female on the nest, the male bird standing close to her, and occasionally feeding her. Sometimes the male relieved the female, but they never both leave the nest until the young one is able to defend itself against the skua gull, a rapacious bird which devours every egg or nestling left unprotected. When Mr. Reischek approached an albatross's nest, the bird seldom left it, but set up a croaking noise, clapping its mandibles together and biting at the intruder. If it was turned off, and the egg taken, it returned and sat on the nest as before. The eggs were quite fresh on January 25, and good for eating when fried.

A VOCABULARY of physical terms, styled "Butsurigaku Jutsugo Jisho," has been issued in Japan. It gives the authoritative Japanese equivalents of an important group of Western scientific terms. In all, thirty-six Japanese gentlemen have been engaged in its preparation for the past six years. The Mathematical and Physical Society of Japan bears the expense of publication. The book consists of four parts arranged alphabetically under the four languages, Japanese, English, French, and German, each part extending over ninety octavo pages, and each page comprising from twenty to twenty-five distinct terms expressed in the four languages. This work, on which so much labour has been expended, can be purchased for the moderate sum of a dollar and a half.

MESSRS. MACMILLAN AND CO. have issued a "Syllabus of Modern Plane Geometry," by the A.I.G.T. The first few sections deal with harmonic ranges and pencils, the properties of the triangle, and properties of the complete quadrilateral and quadrangle; sections v., vi., and vii., with the properties of circles and geometrical maxima and minima; sections viii. and ix., with cross ratios, involution, and reciprocal polars and projection. The various subjects are treated concisely, and the work will be very useful to students.

"HAMPSTEAD HILL," a work on the natural history, &c., of Hampstead, will shortly be published by Messrs. Roper and Drowley. The contributors to the various sections include Prof. J. L. Lobley, H. T. Wharton, Rev. Dr. Walker, and J. E. Harting. The book will be illustrated by engravings of local scenery.

THE second part of Charles Fabre's treatise on photography has just been published (Gauthier-Villars, Paris). The subject of lenses is continued in great detail, and it is not too much to say that a more complete account has never been written. Diaphragms and instantaneous shutters are begun in this part. The illustrations are excellent.

THE Royal Physical Society of Edinburgh has issued its Proceedings during the session 1887-88. The volume includes, besides an opening address, by Prof. Duns, Vice-President, the following papers:—An ornithological visit to the Ascrib Islands, Loch Snizort, Skye, by John Swinburne; on the structure of the Graafian Follicle in *Didelphys*, by Frank E. Beddard; notes on Carboniferous *Selachii*, by Dr. R. H. Traquair, F.R.S.; further notes on Carboniferous *Selachii*, by Dr. R. H. Traquair, F.R.S.; notes on a visit to Fernando Noronha (with plate), by George Ramage; on a new Eurypterid from the Upper Coal-measures of Radstock, Somersetshire (with plate), by B. N. Peach; synthetic summary of the influence of the environment upon the organism, by J. Arthur Thomson; on the prevalence of Eurypterid remains in the Carboniferous shales of Scotland, by James Bennie; on the fructification of two Coal-measure ferns (with plate), by Robert Kidston; on the fructification and affinities of *Archæopteris hibernica*, Forbes, sp., by Robert Kidston; notes on the equipment of the Research Laboratory of the Royal College of Physicians, Edinburgh, by Dr. G. Sims Woodhead; the summer birds of Shetland, with notes on their distribution, nesting, and numbers, by Harold Raeburn.

THE July number of the *Board of Trade Journal* describes, from certain Austrian technical periodicals, the condition of pharmacy in Bulgaria. Most of the departmental capitals, towns of 9000 to 10,000 inhabitants, but including very often an administrative area of 60,000 to 70,000 inhabitants, have only one pharmacy each. These pharmacies might be supposed to do a splendid trade, and they would do so but for the fact that the illegal exercise of the craft, in spite of the stringency of the laws which are intended to protect the legitimate professors of the art, is almost openly practised throughout the country by itinerant hawkers, quacks, and priests. The establishment of pharmacies is only allowed by special concession, and they are subject to a Sanitary Council at Sophia composed of several members, including a chemist and a veterinary surgeon. Nominally there should be a pharmacy for every 8000 inhabitants. Every Bulgarian citizen who has passed the necessary examination is entitled to compete for a concession, but foreigners are only allowed to do so when they can show that they have been qualified in their own country, and after having passed a formal examination in Bulgaria. At least twice a year every pharmacy is officially inspected by the authorities, and subjected to a close examination, which also extends to the books, as there is an official scale of charges for prescriptions which may not be exceeded. The original of every prescription is kept by the pharmacist, who gives his customer a copy stamped with his name, and bearing the price charged, which price is also inscribed upon the original, and the same number given to both. At present the Russian Pharmacopœia is used in Bulgaria, but a native one is in contemplation. There is no Pharmaceutical Society or organization of any kind among pharmacists. A Society which was started about five years ago expired after an existence of three months. The formal examination which is obligatory for foreigners desirous of establishing business in Bulgaria embraces pharmacology, analysis, organic and inorganic chemistry. The fee is very high, £40, half of which is refunded in case of failure. Every foreigner establishing business in Bulgaria is required to sign a declaration placing him under the Bulgarian Pharmacy Law, and to keep at least two apprentices of Bulgarian nationality. The assistants are nearly all foreigners, They generally receive from £2 10*s*. to £3 per month indoors.

THE barium salt of a new acid-forming oxide of cobalt, CoO_2, corresponding to the black dioxide of manganese, MnO_2, has been obtained by M. Rousseau, and is described in the current number of the *Comptes rendus*. It forms large black prismatic crystals, and appears to be a very definite compound of the composition $BaO . CoO_2$, and possessing some stability. The most favourable method of preparing it is as follows. A mixture of 15 grams of crystals of barium chloride or bromide with 5 or 6 grams of finely-powdered anhydrous barium oxide is heated gradually to redness in a platinum crucible. The temperature is then raised in a good furnace to 1000°–1100° C., when 1 gram of sesquioxide of cobalt, Co_2O_3, is introduced by degrees into the fused mass, and the temperature maintained for about five hours. At the expiration of this time a ring of large black prisms, exhibiting beautiful iris-coloured reflections, is formed. The crystals are found to contain a little platinate of barium, owing to the platinum crucible being attacked at the high temperature, but after elimination of this impurity the analyses agree very closely with the formula $BaO . CoO_2$. The crystals of this monocobaltite of barium are soluble in cold concentrated hydrochloric acid with evolution of heat, and dissolve likewise in nitric acid with effervescence. At a higher temperature than 1100° they are decomposed with evolution of oxygen gas, the CoO_2 becoming reduced to a lower oxide, probably Co_3O_4, the usual product of the ignition of cobalt oxides. Hence the necessity for keeping the temperature below 1100° during the preparation. If the fusion be simply performed over the Bunsen lamp, another cobaltite is obtained containing two molecules of CoO_2. A crust of crystals of this second compound, $BaO . 2CoO_2$, is formed over the surface of the melt, consisting of brilliant black hexagonal lamellæ. These crystals are likewise soluble in hydrochloric acid with evolution of chlorine gas. In order to avoid the formation of this di-cobaltite it is necessary to maintain the temperature over 1000°, when the neutral monocobaltite is alone produced. Hence the limits of temperature during which the monocobaltite is produced are 1000°–1100°. Thus cobalt resembles manganese in forming a dioxide, capable of liberating chlorine from hydrochloric acid and combining with basic oxides to form cobaltites analogous to the manganites. But this dioxide of cobalt appears from its reactions to be somewhat weaker in its combinations than manganese dioxide, and to form them with greater difficulty, the barium cobaltites above described being as yet the only ones prepared.

THE additions to the Zoological Society's Gardens during the past week include two Crested Porcupines (*Hystrix cristata*), a Desert Buzzard (*Buteo desertorum*), two Natal Francolines (*Francolinus natalensis* ♂ ♀) from South Africa, presented by Captain Henry F. Hoste, R.M.S. *Trojan*; a Common Wolf (*Canis lupus*, juv.) from Provincia de Leon, Spain, presented by Mr. W. S. Lart; four Violaceous Night Herons (*Nycticorax violaceus*), a Green Bittern (*Butorides virescens*), a Dominican Kestrel (*Tinnunculus dominicensis*), a —— Pigeon (*Columba*, sp. inc.) from St. Kitt's, W.I., presented by Dr. A. P. Boon, C.M.Z.S.; two Ocellated Mantis (*Harpax ocellata*) from South Africa, presented by Colonel J. H. Bowker, F.Z.S.; a Wapiti Deer (*Cervus canadensis* ♀), a Peacock Pheasant (*Polyplectron chinquis*), eight Mandarin Ducks (*Æx galericulata*), five Summer Ducks (*Æx sponsa*), two Chiloe Wigeon (*Mareca chiloensis*), six Chilian Pintails (*Dafila spinicauda*), three Australian Wild Ducks (*Anas superciliosa*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE BINARY γ CORONÆ BOREALIS.—Prof. Celoria has recently determined (*Astr. Nach.*, 2904) a new orbit for this difficult binary (Σ 1967), which appears a decided advance upon that of Dr. Doberck's, published twelve years ago. A considerable uncertainty still attaches, however, to the elements, although the star has now been under observation for sixty-three years, and has been watched through nearly three-fourths of a revolution. This is due partly to the circumstance that the orbit is presented to us nearly in profile, and partly to the closeness of the two components. The measures in both elements, therefore, have been difficult to make, and have often been very discordant. Thus some recent position-angles by Engelmann show a systematic difference of 30° or more as compared with measures made at about the same epoch by Schiaparelli and Perrotin. The companion passed its primary on the north side about 1836, reappearing in 1840 on the preceding side. It re-passed the principal star on the south about 1878, and is now again on the following side. Celoria's new elements compare with Doberck's as follows:—

	Doberck.		Celoria.
T =	1843·70	...	1840·508
☊ =	110° 24′	...	113°·47
λ =	233° 30	...	250·68
γ =	85° 12′	...	81·66
e =	0·350	...	0·34827
a =	0″·70	...	0″·63103
P =	95·50 years.	...	85·276 years.

ECLIPSES AND TRANSITS IN FUTURE YEARS.—The Rev. S. J. Johnson, author of "Eclipses Past and Future," and well known as a calculator of eclipses, presented a large manuscript volume to the Royal Astronomical Society a few months ago containing projections and diagrams of eclipses from the year A.D. 538 to the year 2500. He has now published in a little pamphlet the dates of all the eclipses, both of sun and moon, visible in England from 1700 to 2000, with the solar eclipses for the two following centuries, and the larger solar eclipses up to 2500. The transits of Mercury and Venus are also included, of Venus up to 2500, and of Mercury to 2000.

The twentieth century is distinguished by three years in each of which seven eclipses take place. Of these, Mr. Johnson notices two, 1917 and 1935, the latter being particularly noteworthy as showing five solar eclipses, but does not mention the third case, 1985, though calling attention to the rare occurrence of three total eclipses of the moon which fall that year.

The little pamphlet, which is intended as a kind of supplement to the author's larger work, "Eclipses Past and Future," is illustrated by four pages of diagrams showing the greatest phases of the eclipses up to 1949, as seen from London. The diagrams are nowhere explained, and no indication is supplied as to which are solar and which lunar eclipses. It appears that circles on which the eclipsed portion is shown by deep shading, and which are surrounded by a ring of shade, stand for solar eclipses, the plain circles for lunar eclipses.

THE WHITE SPOT ON SATURN'S RING.—M. Terby, who still strongly contends for the reality of the bright white spot next the shadow of the planet on Saturn's ring, quotes, in the *Astronomische Nachrichten*, No. 2910, an observation of Ceraski's made in 1884, as showing that it is not a mere effect of contrast with the shadow. M. Ceraski, on November 1, 1884, noticed a bright white spot on the ring where it touched the planet in a similar position to M. Terby's spot, but the shadow of the planet fell at that time on the other portion of the ring, so that the spot could not be accounted for by contrast.

COMET 1889 *c* (BARNARD, JUNE 23).—The following ephemeris for this object is by Dr. R. Spitaler (*Astr. Nach.* No. 2909):—

For Berlin Midnight.

1889.		R.A.				Decl.				Log Δ.		Brightness.
		h.	m.	s.		°	′					
July 27	...	3	51	1	...	49	27·4	N.	...	0·1341	...	0·55
31	...	4	6	14	...	49	47·6		...	0·1416	...	0·50
Aug. 4	...	4	20	35	...	50	0·3		...	0·1486	...	0·46
8	...	4	34	0	...	50	7·0		...	0·1549	...	0·43
12	...	4	46	29	...	50	8·5		...	0·1606	...	0·40
16	...	4	58	1	...	50	6·0		...	0·1656	...	0·37
20	...	5	8	37	...	50	0·5	N.	...	0·1699	...	0·34

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 *JULY* 28—*AUGUST* 3.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)